

Town of Brookline Contributory Retirement System

**Actuarial Valuation and Review as of
January 1, 2014**





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November 3, 2014

*Town of Brookline Contributory Retirement System
Stephen Glover Train Memorial Center, 11 Pierce Street
Brookline, MA 02445*

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of January 1, 2014. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2015 and later years and analyzes the preceding two years' experience.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement System. The census information and financial information on which our calculations were based was prepared by the staff of the Brookline Retirement System. That assistance is gratefully acknowledged.


The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.

The actuarial calculations were directed under my supervision. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in my opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: 
Kathleen A. Riley, FSA, MAAA, EA
Senior Vice President and Actuary

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SECTION 1: Valuation Summary for the Town of Brookline Contributory Retirement System

Purpose

This report has been prepared by Segal Consulting to present a valuation of the Town of Brookline Contributory Retirement System as of January 1, 2014. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of M.G.L. Chapter 32;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of January 1, 2014, provided by the Board;
- The assets of the Plan as of December 31, 2013;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

1. The actuarial valuation report as of January 1, 2014 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected.
2. During the plan years ended 2012 and 2013, the market value rates of return were 10.57% and 11.60%, respectively. Because the actuarial value of assets gradually recognizes market value fluctuations over a five-year period, the actuarial rates of return for the plan years ended 2012 and 2013 were 1.30% and 10.04%, respectively. The actuarial value of assets as of December 31, 2013 was \$241.7 million, or 98.5% of the market value of assets of \$245.5 million reported in the Annual Statement. As of December 31, 2011, the actuarial value of assets of \$222.8 million was 109.0% of the market value of \$204.5 million.
3. As indicated in Section 2, Subsection B of this report, the total unrecognized investment gain as of December 31, 2013 is \$3,732,701. This investment gain will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent it is not offset by recognition of investment losses derived from future experience. This implies that earning the assumed rate of investment return of 7.60% per year (net of expenses) on a market value basis will result in investment gains on the actuarial value of assets in the next few years.

SECTION 1: Valuation Summary for the Town of Brookline Contributory Retirement System

4. This valuation reflects the following changes in actuarial assumptions and methods:

- The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.
- The investment return assumption was lowered from 7.75% to 7.60%.
- The mortality assumption for non-disabled retirees was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally from 2010 using Scale AA.
- The mortality assumption for employees was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2010 using Scale AA.
- The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward two years projected generationally from 2010 using Scale AA.
- The salary increase assumption was reset to the following:

	2014 and 2015	2016 and later
Groups 1 and 2	3.50%	4.50%
Group 4	3.50%	4.75%

- The assumed retirement age for terminated vested participants was changed from age 65 to age 60 for Group 1 and 2 members and remained the same at age 55 for Group 4 members hired prior to April 2, 2012. For participants hired April 2, 2012 or later, the assumption is age 60 for Group 1 members, age 55 for Group 2 members, and age 50 for Group 4 members.
- The administrative expense assumption was increased from \$370,000 for calendar 2012 to \$415,000 for calendar 2014.

The changes in assumptions and method increased the unfunded liability by \$10.6 million and increased the normal cost by \$115,000.

5. The following plan change is included in this valuation:

- Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.

SECTION 1: Valuation Summary for the Town of Brookline Contributory Retirement System

6. The unfunded liability was expected to decrease from \$176.1 million as of January 1, 2012 to \$175.9 million as of January 1, 2014. The actual unfunded liability of \$192.6 million is \$16.7 million higher than expected primarily due to an investment loss on an actuarial basis and the changes in assumptions noted above, partially offset by an experience gain due to salary increases less than expected.
7. The recommended contribution for fiscal 2015 is equal to the previously budgeted amount of \$18,204,932. The results of this valuation will first be reflected in the fiscal 2016 appropriation. The funding schedule in Chart 16 fully funds the Retirement System by June 30, 2030 with appropriations increasing 5.50% per year. The prior funding schedule fully funded the System by June 30, 2030 with appropriations that increase 5.90% per year.
8. Section 4 includes the disclosure information required by Governmental Accounting Standards Board (GASB) Statements No. 25 and 27. Section 5 shows the format of the disclosure information required by GASB Statements No. 67 and 68. The exhibits in Section 5 will be completed at the end of the year when December 31, 2014 financial information is available. At that time, the liabilities will be projected to the end of the year and the allocations to each employer will be determined.

SECTION 1: Valuation Summary for the Town of Brookline Contributory Retirement System

Summary of Key Valuation Results

	2014	2012
Contributions for fiscal year beginning July 1:		
Recommended for fiscal 2015 and 2013	\$18,204,932	\$16,232,938
Recommended for fiscal 2016 and 2014	19,206,203	17,190,681
Recommended for fiscal 2017 and 2015	20,262,544	18,204,932
Funding elements for plan year beginning January 1:		
Normal cost, including administrative expenses	\$9,670,302	\$8,986,109
Market value of assets	245,478,646	204,480,493
Actuarial value of assets	241,745,944	222,782,140
Actuarial accrued liability	434,346,018	398,901,990
Unfunded actuarial accrued liability	192,600,074	176,119,850
Funded ratio based on market value of assets	56.52%	51.26%
Funded ratio based on actuarial value of assets	55.66%	55.85%
Demographic data for plan year beginning January 1:		
Number of retired participants and beneficiaries	877	875
Number of inactive participants entitled to a return of their employee contributions	1,394	1,405
Number of inactive participants with a vested right to a deferred or immediate benefit	43	38
Number of active participants	1,259	1,188
Total payroll	\$62,777,421	\$61,285,463
Average payroll	49,863	51,587

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

A. PARTICIPANT DATA

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A and B.

A historical perspective of how the participant population has changed over the past eight valuations can be seen in this chart.

CHART 1

Participant Population: 1999 – 2013

Year Ended December 31	Active Participants	Inactive Participants*	Retired Participants and Beneficiaries
1999	1,158	507	790
2001	1,278	504	789
2003	1,420	626	811
2005	1,440	924	817
2007	1,413	994	835
2009	1,272	1,284	853
2011	1,188	1,443	875
2013	1,259	1,437	877

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Active Participants

Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 1,259 active participants with an average age of 43.3, average years of service of 11.1 years and average payroll of \$49,863. The 1,188 active participants in the prior valuation had an average age of 44.1, average service of 11.7 years and average payroll of \$49,520.

Among the active participants, there were none with unknown age and/or service information.

Inactive Participants

In this year's valuation, there were 43 participants with a vested right to a deferred or immediate vested benefit and 1,394 participants entitled to a return of their employee contributions.

These graphs show a distribution of active participants by age and by years of service.

CHART 2

Distribution of Active Participants by Age as of December 31, 2013

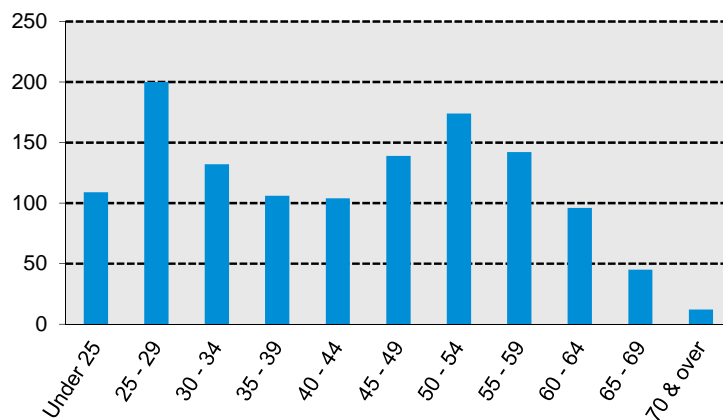
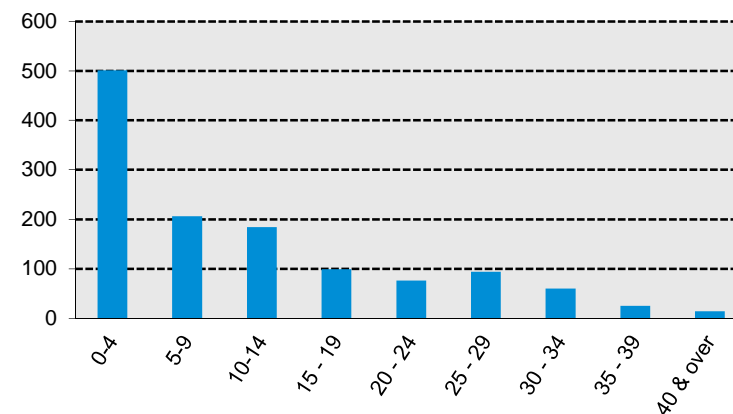


CHART 3

Distribution of Active Participants by Years of Service as of December 31, 2013



SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Retired Participants and Beneficiaries

As of December 31, 2013, 697 retired participants and 180 beneficiaries were receiving total monthly benefits of \$2,144,354, excluding COLAs reimbursed by the Commonwealth. For comparison, in the previous valuation, there were 680 retired participants and 195 beneficiaries receiving monthly benefits of \$2,001,719, excluding COLAs reimbursed by the Commonwealth.

These graphs show a distribution of the current retired participants and beneficiaries based on their monthly amount and age, by type of pension.

CHART 4

Distribution of Retired Participants and Beneficiaries by Type and by Monthly Amount as of December 31, 2013

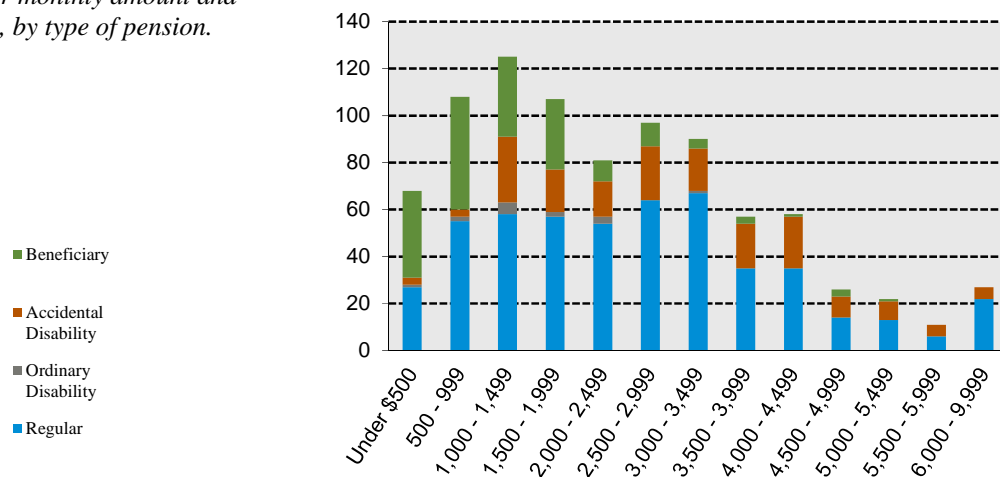
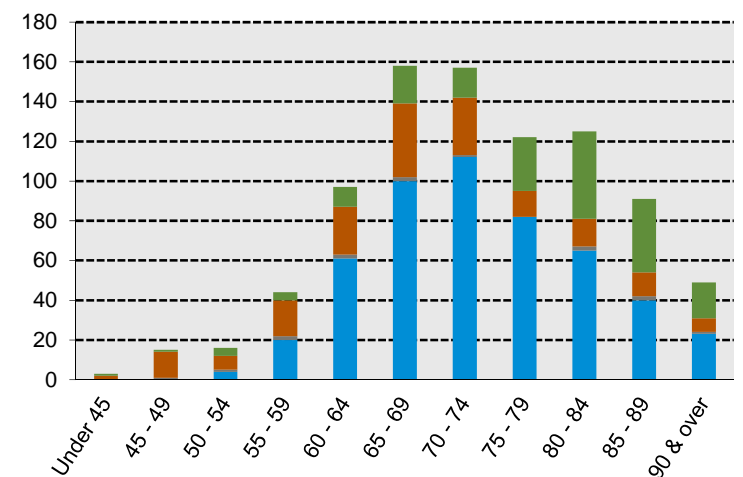


CHART 5

Distribution of Retired Participants and Beneficiaries by Type and by Age as of December 31, 2013



SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

B. FINANCIAL INFORMATION

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

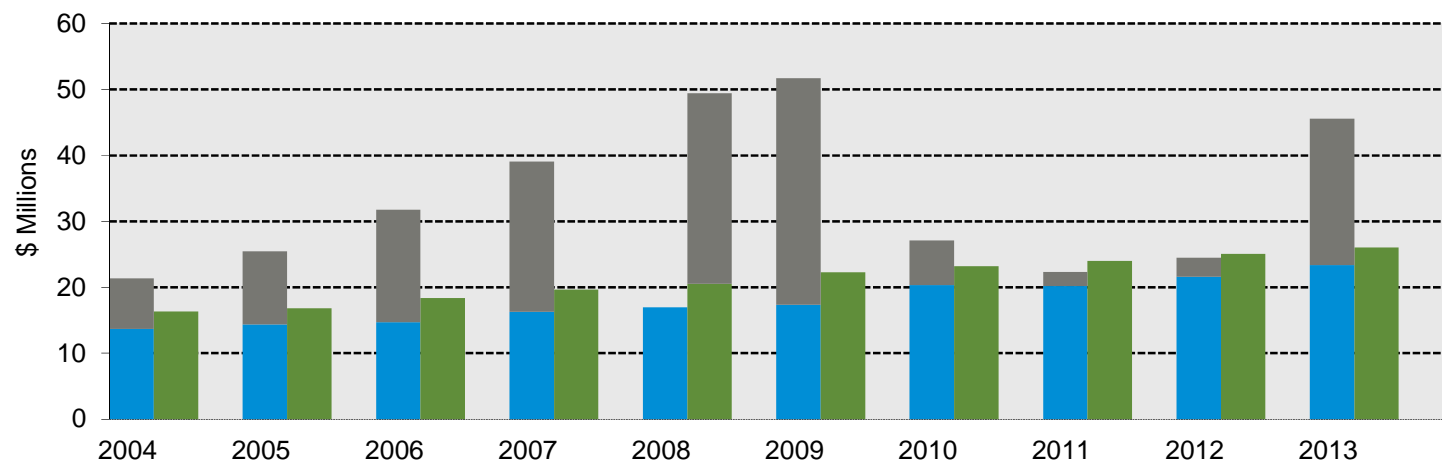
Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits C and D.

The chart depicts the components of changes in the actuarial value of assets over the last ten years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.

■ Net investment income
■ Benefits paid
■ Net contributions

CHART 6

Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended December 31, 2004 – 2013



SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

The chart shows the determination of the actuarial value of assets as of the valuation date.

CHART 7

Determination of Actuarial Value of Assets

	Year Ended	
	December 31, 2013	December 31, 2012
1. Market value of assets, December 31, 2013	\$245,478,646	\$222,435,596
2. Calculation of unrecognized return*	Original <u>Amount</u>	Unrecognized <u>Return</u>
(a) Year ended December 31, 2013	\$8,519,178	\$6,815,343
(b) Year ended December 31, 2012	5,436,466	3,261,879
(c) Year ended December 31, 2011	-20,910,377	-8,364,151
(d) Year ended December 31, 2010	10,098,153	2,019,631
(e) Year ended December 31, 2009	22,048,404	0
(f) Total unrecognized return	3,732,701	4,409,681
3. Preliminary actuarial value: (1) - (2f)	241,745,944	222,183,707
4. Adjustment to be within 10% corridor	0	0
5. Final actuarial value of assets: (3) + (4)	<u>\$241,745,944</u>	<u>\$222,183,707</u>
6. Actuarial value as a percentage of market value: (5) ÷ (1)	98.5%	99.9%
7. Amount deferred for future recognition: (1) - (5)	\$3,732,701	\$251,889

**Unrecognized return is the difference between total return and the expected return on a market value basis and is recognized over a five-year period.*

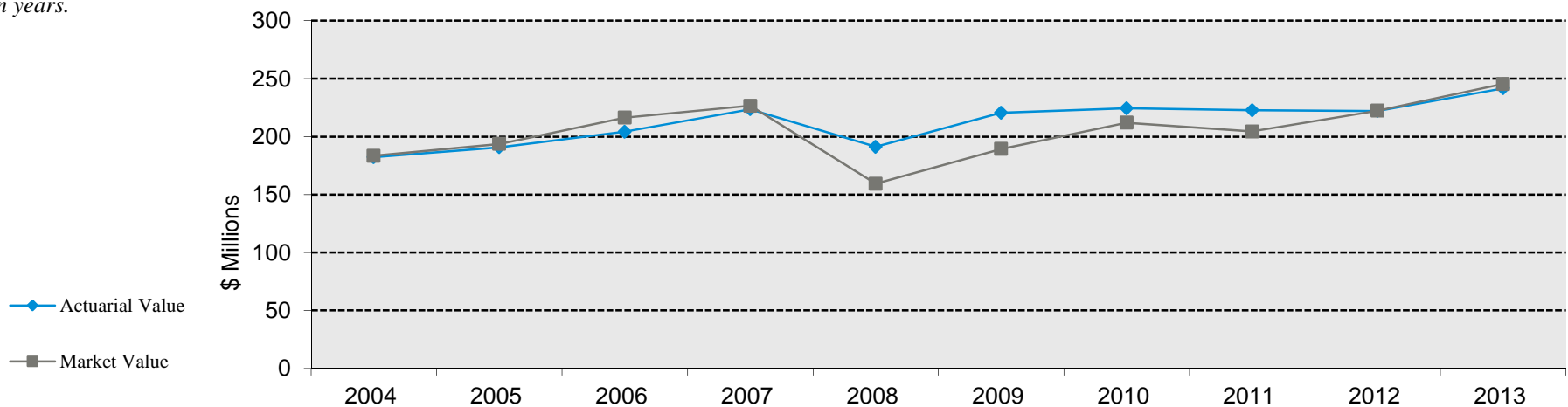
SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Both the actuarial value and market value of assets are representations of the Brookline Retirement System's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Brookline Retirement System's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

This chart shows the change in the actuarial value of assets versus the market value over the past ten years.

CHART 8

Actuarial Value of Assets vs. Market Value of Assets as of December 31, 2004 – 2013



SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

C. ACTUARIAL EXPERIENCE

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss over the two-year period is \$6,120,447. A discussion of the major components of the actuarial experience is on the following pages.

This chart provides a summary of the actuarial experience over the past two years.

CHART 9

Actuarial Experience for Two-Year Period Ended December 31, 2013

1. Net loss from investments*	-\$10,302,200
2. Net loss from administrative expenses	-26,535
3. Net gain from other experience**	<u>4,208,288</u>
4. Net experience loss: (1) + (2) + (3)	-\$6,120,447

* Details in Chart 10

** Details in Chart 13

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Brookline Retirement System's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets was 7.75%. The actual rate of return on an actuarial basis for the 2013 and 2012 plan years were 10.04% and 1.30%, respectively.

Since the actual return for the year was greater than the assumed return, the Brookline Retirement System experienced an actuarial loss of \$10,302,200 (including an adjustment for interest) during the two-year period ending December 31, 2013 with regard to its investments.

This chart shows the gain/(loss) due to investment experience.

CHART 10 Actuarial Value Investment Experience

	Year Ended	
	December 31, 2013	December 31, 2012
1. Actual return	\$22,175,847	\$2,875,693
2. Average value of assets	220,876,902	221,045,077
3. Actual rate of return: (1) ÷ (2)	10.04%	1.30%
4. Assumed rate of return	7.75%	7.75%
5. Expected return: (2) x (4)	\$17,117,960	\$17,130,994
6. Actuarial gain/(loss): (1) – (5)	<u>\$5,057,887</u>	<u>-\$14,255,301</u>

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

Based upon this experience and future expectations, we have lowered the assumed rate of return from 7.75% to 7.60%.

CHART 11

Investment Return – Actuarial Value vs. Market Value: 2004 - 2013

Year Ended December 31	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
2004	\$7,673,916	4.36%	\$18,082,401	10.85%
2005	11,103,381	6.14	12,756,431	7.00
2006	17,054,407	9.02	26,325,161	13.72
2007	22,781,177	11.25	13,627,588	6.35
2008	-28,862,361	-13.01	-63,712,070	-28.34
2009	34,376,021	18.22	34,985,988	22.31
2010	6,761,566	3.09	25,598,989	13.62
2011	2,107,035	0.95	-3,782,649	-1.80
2012	2,875,693	1.30	21,429,229	10.57
2013	<u>22,175,847</u>	10.04	<u>25,656,659</u>	11.60
Total	\$98,046,682		\$110,967,727	
	Five-year average return	6.37%		10.61%
	Ten-year average return	4.80%		5.66%

Note: Each year's yield is weighted by the average asset value in that year.

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

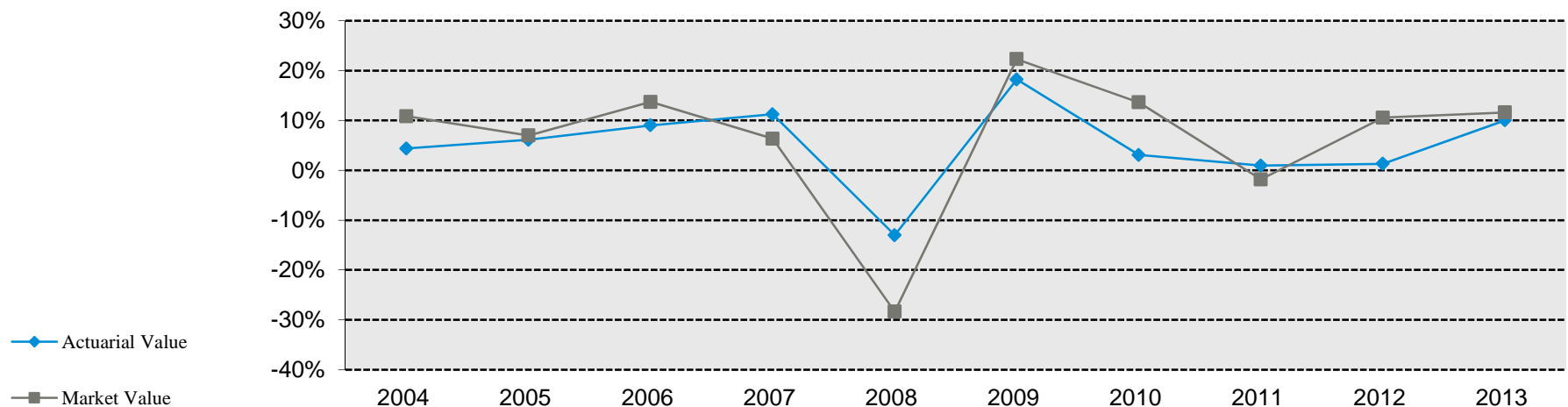
Administrative Expenses

Administrative expenses for the years ended December 31, 2012 and 2013 were \$266,717 and \$514,559, respectively, compared to the assumption of \$370,000 for calendar 2010 and \$386,650 for calendar 2011, including an adjustment for interest. This resulted in a loss of \$26,535 for the year. We have increased the assumption to \$415,000 for calendar year 2014.

This chart illustrates how this leveling effect has actually worked over the years 2004 - 2013.

CHART 12

Market and Actuarial Rates of Return for Years Ended December 31, 2004 - 2013



SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements, and
- salary increases different than assumed.

The net gain from this other experience for the two-year period ending December 31, 2013 amounted to \$4,208,288, which is 0.1% of the actuarial accrued liability.

A brief summary of the demographic gain/(loss) experience of the Brookline Retirement System for the two-year period ending December 31, 2013 is shown in the chart below.

This valuation reflects the following changes in actuarial assumptions and methods:

- The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.
- The investment return assumption was lowered from 7.75% to 7.60%.
- The mortality assumption for non-disabled retirees was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally from 2010 using Scale AA.
- The mortality assumption for employees was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2010 using Scale AA.
- The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward two years projected generationally from 2010 using Scale AA.

The chart shows elements of the experience gain/(loss) for the most recent years.

CHART 13

Experience Due to Changes in Demographics for Two-Year Period Ended December 31, 2013

1. Salary increase for continuing actives less than expected	\$2,884,175
2. Fewer deaths than expected amongst retired members and beneficiaries	-455,436
3. Miscellaneous gain	<u>1,779,549</u>
4. Net experience gain	\$4,208,288

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

- The salary increase assumption was reset to the following:

	<u>2014 and 2015</u>	<u>2016 and later</u>
Groups 1 and 2	3.50%	4.50%
Group 4	3.50%	4.75%

- The assumed retirement age for terminated vested participants was changed from age 65 to age 60 for Group 1 and 2 members and remained the same at age 55 for Group 4 members hired prior to April 2, 2012. For participants hired April 2, 2012 or later, the assumption is age 60 for Group 1 members, age 55 for Group 2 members, and age 50 for Group 4 members.
- The administrative expense assumption was increased from \$370,000 for calendar 2012 to \$415,000 for calendar 2014.

The changes in assumptions and method increased the unfunded liability by \$10.6 million and increased the normal cost by \$115,000.

The following plan change is included in this valuation:

- Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

Chart 14 below provides a reconciliation of the unfunded liability from the prior valuation to the current valuation.

The unfunded liability was expected to decrease from \$176.1 million as of January 1, 2012 to \$175.9 million as of January 1, 2014. The actuarial unfunded liability as of January 1, 2014 of \$192.6 million is \$16.7 million higher than expected as detailed in Chart 14 below.

CHART 14

Development of Unfunded Actuarial Accrued Liability and (Gain)/Loss

	Year Ended	
	December 31, 2013	December 31, 2012
1. Unfunded actuarial accrued liability at beginning of year	\$176,796,616	\$176,119,850
2. Normal cost at beginning of year	9,390,484	8,986,109
3. Total contributions	-23,918,532	-21,888,050
4. Interest		
(a) For whole year on (1) + (2)	\$14,429,500	\$14,345,712
(b) For half year on (3)	<u>-838,156</u>	<u>-767,005</u>
(c) Total interest	<u>13,591,344</u>	<u>13,578,707</u>
5. Expected unfunded actuarial accrued liability	\$175,859,912	\$176,796,616
6. Changes due to:		
(a) Experience loss	\$6,120,447	--
(b) Assumption changes	<u>10,619,715</u>	--
(c) Total changes	<u>16,740,162</u>	--
7. Unfunded actuarial accrued liability at end of year: (5) + (6c)	<u>\$192,600,074</u>	--

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

D. RECOMMENDED CONTRIBUTION

The amount of annual contribution required to fund the Plan is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability.

The recommended contribution for fiscal 2015 is set equal to the Town's previously budgeted amount of \$18,204,932. The results of this valuation will first be reflected in the fiscal 2016 appropriation. The funding schedule in Chart 16 fully funds the Retirement System by June 30, 2030 with appropriations increasing 5.50% per year. The prior funding schedule fully funded the System by June 30, 2030 with appropriations increasing 5.90% per year.

The chart compares this valuation's recommended contribution with the prior valuation.

CHART 15
Recommended Contribution

	Year Beginning January 1			
	2014		2012	
	Amount	% of Payroll	Amount	% of Payroll
1. Total normal cost	\$9,255,302	14.28%	\$8,616,109	14.06%
2. Administrative expenses	415,000	0.64%	370,000	0.60%
3. Expected employee contributions	<u>-6,083,092</u>	<u>-9.38%</u>	<u>-5,655,867</u>	<u>-9.23%</u>
4. Employer normal cost: (1) + (2) + (3)	\$3,587,210	5.53%	\$3,330,242	5.43%
5. Actuarial accrued liability	434,346,018		398,901,990	
6. Actuarial value of assets	<u>241,745,944</u>		<u>222,782,140</u>	
7. Unfunded actuarial accrued liability: (5) - (6)	\$192,600,074		\$176,119,850	
8. Employer normal cost projected to July 1, 2014 and 2012, adjusted for timing*	3,716,893	5.64%	3,432,407	5.48%
9. Projected unfunded actuarial accrued liability	199,784,865		180,510,802	
10. Payment on projected unfunded actuarial accrued liability, adjusted for timing*	14,488,039	21.96%	12,800,531	20.43%
11. Total recommended contribution: (8) + (10)	<u>\$18,204,932</u>	<u>27.60%</u>	<u>\$16,232,938</u>	<u>25.91%</u>
12. Projected payroll	\$65,953,921		\$62,649,213	

* Contributions are assumed to be paid bimonthly between July 1 and December 31.

SECTION 2: Valuation Results for the Town of Brookline Contributory Retirement System

CHART 16

Fully Funded by 2030 with appropriations increasing 5.50% per year

(1) Fiscal Year Ended June 30	(2) Employer Normal Cost	(3) Amortization of 2003 ERI Liability	(4) Amortization of Remaining Liability	(5) Total Plan Cost: (2) + (3) + (4)	(6) Total Unfunded Actuarial Accrued Liability at Beginning of Fiscal Year	(7) Total Plan Cost: % Increase
2015	\$3,716,893	\$4,396	\$14,483,643	\$18,204,932	\$199,784,865	--
2016	3,861,872	4,593	15,339,737	19,206,203	199,379,471	5.50%
2017	4,051,239	4,800	16,206,505	20,262,544	198,321,410	5.50%
2018	4,249,851	5,016	17,122,116	21,376,984	196,266,999	5.50%
2019	4,458,161	5,242	18,089,315	22,552,718	193,088,905	5.50%
2020	4,676,640	5,478	19,111,000	23,793,117	188,647,216	5.50%
2021	4,905,781	5,724	20,190,234	25,101,739	182,788,325	5.50%
2022	5,146,105	5,982	21,330,247	26,482,335	175,343,714	5.50%
2023	5,398,155	6,251	22,534,458	27,938,863	166,128,645	5.50%
2024	5,662,500	6,532	23,806,468	29,475,500	154,940,728	5.50%
2025	5,939,738	6,826	25,150,089	31,096,653	141,558,385	5.50%
2026	6,230,497	7,133	26,569,339	32,806,969	125,739,172	5.50%
2027	6,535,432	7,454	28,068,466	34,611,352	107,217,971	5.50%
2028	6,855,234	7,790	29,651,953	36,514,976	85,705,030	5.50%
2029	7,190,624	8,140	31,324,536	38,523,300	60,883,839	5.50%
2030	7,542,359	8,506	32,999,274	40,550,139	32,408,823	5.26%
2031	7,911,233	-	-	7,911,233	-	-80.49%

Notes: Contributions are assumed to be paid bimonthly between July 1 and December 31.

Item (2) reflects 3.5% growth in payroll in fiscal year 2016 and 4.5% growth thereafter, as well as 0.15% adjustment to normal cost to reflect the effects of mortality improvement due to generational mortality assumption.

Item (3) increases at 4.50% per year.

Assumes contribution of budgeted amount for fiscal year 2015.

SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System

EXHIBIT A

Table of Plan Coverage

	Year Ended December 31		Change From Prior Year
Category	2013	2011	
Active participants in valuation:			
Number	1,259	1,188	6.0%
Average age	43.3	44.1	N/A
Average years of service	11.1	11.7	N/A
Total payroll	\$62,777,421	\$58,829,946	6.7%
Average payroll	49,863	49,520	0.7%
Member contributions	60,369,741	55,909,785	8.0%
Inactive participants with a vested right to a deferred or immediate benefit	43	38	13.2%
Inactive participants entitled to a return of their contributions	1,394	1,405	-0.8%
Retired participants:			
Number in pay status	507	494	2.6%
Average age	73.3	73.2	N/A
Average monthly benefit	\$2,648	\$2,538	4.3%
Disabled participants:			
Number in pay status	190	186	2.2%
Average age	68.0	67.9	N/A
Average monthly benefit	\$2,963	\$2,747	7.9%
Beneficiaries in pay status:			
Number in pay status	180	195	-7.7%
Average age	78.2	78.2	N/A
Average monthly benefit	\$1,327	\$1,215	9.2%

SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System

EXHIBIT B

Participants in Active Service as of December 31, 2013 By Age, Years of Service, and Average Payroll

Age	Years of Service									
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	109	107	2	--	--	--	--	--	--	--
	\$23,134	\$23,316	\$13,384	--	--	--	--	--	--	--
25 - 29	200	172	25	3	--	--	--	--	--	--
	\$31,024	\$28,226	\$47,414	\$54,848	--	--	--	--	--	--
30 - 34	132	75	41	16	--	--	--	--	--	--
	\$46,028	\$35,622	\$58,645	\$62,476	--	--	--	--	--	--
35 - 39	106	29	32	39	6	--	--	--	--	--
	\$57,753	\$38,600	\$56,736	\$70,796	\$70,977	--	--	--	--	--
40 - 44	104	26	17	29	29	3	--	--	--	--
	\$61,294	\$38,709	\$60,120	\$64,305	\$78,319	\$69,993	--	--	--	--
45 - 49	139	38	20	21	18	28	14	--	--	--
	\$58,029	\$34,929	\$48,592	\$60,246	\$72,234	\$80,432	\$67,814	--	--	--
50 - 54	174	30	21	38	19	15	35	16	--	--
	\$58,002	\$35,241	\$41,049	\$54,005	\$54,202	\$67,794	\$76,909	\$86,391	--	--
55 - 59	142	13	26	22	11	12	24	30	3	1
	\$62,040	\$48,703	\$36,975	\$49,083	\$67,749	\$57,198	\$68,372	\$88,271	\$121,924	\$48,924
60 - 64	96	5	13	8	8	10	16	11	19	6
	\$59,657	\$33,576	\$30,658	\$44,429	\$43,110	\$57,406	\$60,556	\$69,667	\$88,579	\$78,004
65 - 69	45	6	6	7	5	6	5	2	3	5
	\$50,862	\$48,074	\$48,757	\$37,144	\$52,334	\$58,849	\$38,928	\$48,299	\$49,445	\$78,689
70 & over	12	--	3	1	3	2	--	1	--	2
	\$41,265	--	\$11,625	\$12,158	\$58,959	\$47,991	--	\$75,757	--	\$49,766
Total	1,259	501	206	184	99	76	94	60	25	14
	\$49,863	\$31,180	\$48,424	\$58,776	\$66,221	\$68,270	\$68,571	\$82,818	\$87,884	\$72,138

SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System

EXHIBIT C

Summary Statement of Income and Expenses on an Actuarial Value Basis

	Year Ended December 31, 2013	Year Ended December 31, 2012
Contribution income:		
Employer contributions	\$17,890,681	\$16,233,221
Employee contributions	5,989,426	5,604,217
Other contributions	38,425	50,612
Less administrative expenses	<u>-514,559</u>	<u>-266,717</u>
Net contribution income	\$23,403,973	\$21,621,333
Net investment income	<u>22,175,847</u>	<u>2,875,693</u>
Total income available for benefits	\$45,579,820	\$24,497,025
Less benefit payments:		
Pensions	-\$25,294,935	-\$24,614,555
Net 3(8)(c) reimbursements	-297,036	-271,008
Refunds, annuities, & Option B refunds	<u>-425,611</u>	<u>-209,895</u>
Net benefit payments	-\$26,017,583	-\$25,095,458
Change in reserve for future benefits	\$19,562,237	-\$598,433

SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System**EXHIBIT D****Development of the Fund Through December 31, 2013**

Year Ended December 31	Employer Contributions	Employee Contributions	Other Contributions	Net Investment Return*	Administrative Expenses	Benefit Payments	Actuarial Value of Assets at End of Year
2004	\$9,533,000	\$4,398,536	\$34,350	\$7,673,916	\$263,603	\$16,337,355	\$182,192,309
2005	9,937,000	4,660,864	34,078	11,103,381	269,410	16,840,017	190,818,205
2006	10,239,000	4,764,538	35,279	17,054,407	322,510	18,379,716	204,209,203
2007	11,367,567	5,171,789	53,424	22,781,177	311,228	19,672,957	223,598,975
2008	11,878,412	5,407,366	30,190	-28,862,361	340,020	20,556,441	191,156,121
2009	12,568,346	5,091,010	42,957	34,376,021	370,324	22,287,148	220,576,982
2010	15,321,487	5,373,252	48,630	6,761,566	407,973	23,212,746	224,461,197
2011	15,025,000	5,526,527	22,366	2,107,035	357,439	24,002,548	222,782,140
2012	16,233,221	5,604,217	50,612	2,875,693	266,717	25,095,458	222,183,707
2013	17,890,681	5,989,426	38,425	22,175,847	514,559	26,017,583	241,745,944

* Net of investment fees

SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System

EXHIBIT E

Table of Amortization Bases as of July 1, 2014

Type	Annual Payment	Years Remaining	Outstanding Balance
2003 ERI	\$4,396	16.00	\$55,962
Remaining unfunded liability	<u>14,483,643</u>	16.00	<u>199,728,903</u>
Total	\$14,488,039		\$199,784,865

Notes: Payments are adjusted for timing.

2003 ERI increases at 4.50%.

Payment on remaining unfunded liability reflects adjustment to set fiscal 2015 appropriation to budgeted amount.

SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System

EXHIBIT F

Definitions of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Assumptions or actuarial assumptions:

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Normal cost:

The amount of contributions required to fund the benefit allocated to the current year of service.

Actuarial accrued liability for actives:

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

Actuarial accrued liability for pensioners:

The single sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

Unfunded actuarial accrued liability:

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There are many approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

SECTION 3: Supplemental Information for the Town of Brookline Contributory Retirement System

**Amortization of the unfunded
actuarial accrued liability:**

Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

Investment return:

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

EXHIBIT I

Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Retired participants as of the valuation date (including 180 beneficiaries in pay status)	877
2. Participants active during the year ended December 31, 2013 with total accumulated contributions of \$60,369,741 and projected payroll of \$64,829,168	1,259
3. Inactive participants entitled to a return of their employee contributions as of December 31, 2013	1,394
4. Inactive participants with a vested right to a deferred or immediate benefit as of December 31, 2013	43

The actuarial factors as of January 1, 2014 are as follows:

1. Normal cost	\$9,255,302
2. Administrative expenses	415,000
3. Expected employee contributions	<u>-6,083,092</u>
4. Employer normal contributions: (1) + (2) + (3)	\$3,587,213
5. Actuarial accrued liability	434,346,018
Retired participants and beneficiaries	\$244,265,717
Active participants	183,569,648
Inactive participants	6,510,653
6. Actuarial value of assets (\$245,478,646 at market value as reported in the Annual Statement)	241,745,944
7. Unfunded actuarial accrued liability: (5) – (6)	192,600,074

The actuarial factors projected to July 1, 2014 are as follows:

1. Employer normal cost projected to July 1, 2014, adjusted for timing	\$3,716,893
2. Projected unfunded actuarial accrued liability	199,784,863
3. Payment on projected unfunded actuarial accrued liability, adjusted for timing	14,488,039
4. Recommended contribution: (1) + (3)	<u>\$18,204,932</u>
5. Projected payroll	\$65,953,921

Note: Contributions are assumed to be paid bimonthly between July 1 and December 31.

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

EXHIBIT II

Supplementary Information Required by the GASB – History of Employer Contributions

Plan Year Ended December 31	Annual Required Contributions (ARC)	Actual Contributions	Percentage Contributed
2004	\$9,533,000	\$9,533,000	100.0%
2005	9,937,000	9,937,000	100.0%
2006	10,239,000	10,239,000	100.0%
2007	11,367,567	11,367,567	100.0%
2008	11,878,412	11,878,412	100.0%
2009	12,568,346	12,568,346	100.0%
2010	15,321,487	15,321,487	100.0%
2011	15,025,000	15,025,000	100.0%
2012	16,233,221	16,233,221	100.0%
2013	17,890,681	17,890,681	100.0%

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System**EXHIBIT III****Supplementary Information Required by the GASB – Schedule of Funding Progress**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)
01/01/1996	\$93,285,890	\$156,258,190	\$62,972,300	59.70%	\$36,686,332	171.65%
01/01/1998	121,604,190	192,305,540	70,701,350	63.23%	40,150,666	176.09%
01/01/2000	160,983,529	217,964,030	56,980,501	73.86%	43,028,894	132.42%
01/01/2002	171,285,347	250,478,343	79,192,996	68.38%	45,109,610	175.56%
01/01/2004	177,153,465	265,441,629	88,288,164	66.74%	52,378,086	168.56%
01/01/2006	190,818,205	299,355,769	108,537,564	63.74%	57,008,822	190.39%
01/01/2008	223,598,975	332,222,063	108,623,088	67.30%	59,789,007	181.68%
01/01/2010	220,576,982	357,980,915	137,403,933	61.62%	58,622,493	234.39%
01/01/2012	222,782,140	398,901,990	176,119,850	55.85%	61,285,463	287.38%
01/01/2014	241,745,944	434,346,018	192,600,074	55.66%	64,829,168	297.09%

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

EXHIBIT IV

Supplementary Information Required by the GASB

Valuation date	January 1, 2014		
Actuarial cost method	Entry Age Normal Cost Method		
Amortization method	Appropriation increases 5.50% per year		
Remaining amortization period	16 years		
Asset valuation method	The difference between the expected return and actual investment return on a market value basis is recognized over a five-year period. Asset value is adjusted as necessary to be within 20% of the market value.		
Actuarial assumptions:			
Investment rate of return	7.60% (previously, 7.75%)		
Projected salary increases		2014 and 2015	2016 and later
	Group 1 and Group2	3.50%	4.50%
	Group 4	3.50%	4.75%
Cost of living adjustments	3.00% of first \$13,000 of retirement income		
Plan membership:			
Retired participants and beneficiaries receiving benefits	877		
Terminated employees entitled to a return of their employee contributions	1,394		
Terminated employees with a vested right to a deferred or immediate benefit	43		
Active participants	<u>1,259</u>		
Total	3,573		

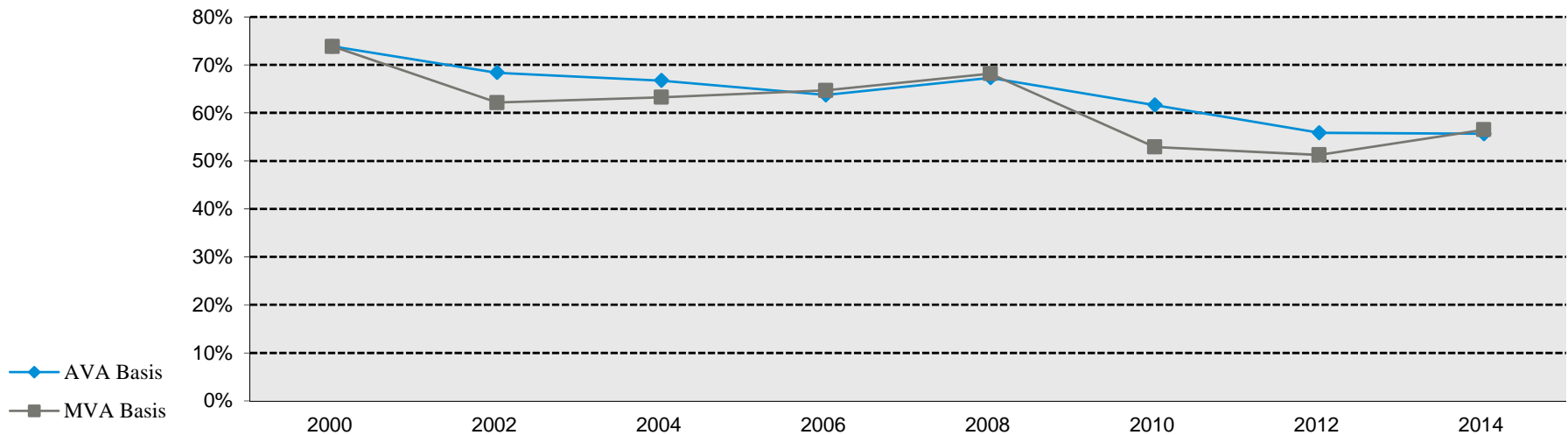
SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

EXHIBIT V

Funded Ratio

A critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the Plan as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

The chart below depicts a history of the funded ratios for this plan. On a market value basis, the funded ratio has increased from 51.26% as of January 1, 2012 to 56.52% as of January 1, 2014. On an actuarial basis, the funded ratio has decreased from 55.85% as of January 1, 2012 to 55.66% as of January 1, 2014.



SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

EXHIBIT VI
Actuarial Assumptions and Actuarial Cost Method

Mortality Rates:

<i>Healthy:</i>	
<i>Pre-Retirement</i>	RP-2000 Employee Mortality Table projected generationally with Scale AA from 2010 (Previously, RP-2000 Employee Mortality Table projected 12 years with Scale AA)
<i>Post-Retirement</i>	RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale AA from 2010 (Previously, RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA)
<i>Disabled:</i>	RP-2000 Employee Mortality Table set forward two years projected generationally with Scale AA from 2010 (Previously, RP-2000 Health Annuitant Mortality Table set forward 2 years)
The RP-2000 Employee Mortality Table and the RP-2000 Healthy Annuitant Mortality Table reasonably reflect the mortality of the Plan as of the measurement date. The mortality tables were then adjusted to future years using generational projection under Scale AA from 2010 to reflect future mortality improvements.	

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

Termination Rates before Retirement:

Groups 1 and 2 – Rate (%)

Age	Mortality				Disability
	Male		Female		
	Current	Previous	Current	Previous	
20	0.03	0.03	0.02	0.02	0.01
25	0.04	0.03	0.02	0.02	0.02
30	0.04	0.04	0.03	0.02	0.03
35	0.08	0.07	0.05	0.04	0.06
40	0.11	0.10	0.07	0.06	0.20
45	0.15	0.13	0.11	0.09	0.29
50	0.21	0.17	0.17	0.14	0.58
55	0.30	0.24	0.25	0.23	0.71
60	0.49	0.40	0.40	0.37	0.84

Notes: Mortality rates do not reflect generational projection.
 55% of the disability rates shown represent accidental disability.
 20% of the accidental disabilities will die from the same cause as the disability.
 55% of the death rates shown represent accidental death.

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

Group 4 – Rate (%)					
Age	Mortality				Disability
	Male		Female		
	Current	Previous	Current	Previous	
20	0.03	0.03	0.02	0.02	0.10
25	0.04	0.03	0.02	0.02	0.20
30	0.04	0.04	0.03	0.02	0.30
35	0.08	0.07	0.05	0.04	0.30
40	0.11	0.10	0.07	0.06	0.60
45	0.15	0.13	0.11	0.09	2.00
50	0.21	0.17	0.17	0.14	3.75
55	0.30	0.24	0.25	0.23	3.60
60	0.49	0.40	0.40	0.37	2.55
Notes:	Mortality rates do not reflect generational projection.				
	90% of the disability rates shown represent accidental disability.				
	60% of the accidental disabilities will die from the same cause as the disability.				
	90% of the death rates shown represent accidental death.				

Withdrawal Rates:

Rate per year (%)			
Years of Service	Groups 1 and 2	Years of Service	Group 4
0	15.0	0 – 10	1.5
1	12.0	11+	0.0
2	10.0		
3	9.0		
4	8.0		
5 – 9	7.6		
10 – 14	5.4		
15 – 19	3.3		
20 – 24	2.0		
25 - 29	1.0		
30+	0.0		

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

Retirement Rates:**Rate per year (%)**

Age	Groups 1 and 2	Group 4
55	5.0	15.0
56 – 58	2.5	10.0
59	2.5	15.0
60	10.0	20.0
61	15.0	20.0
62 - 63	10.0	25.0
64	10.0	30.0
65	40.0	100.0
66 - 67	25.0	--
68 - 69	30.0	--
70	100.0	--

**Retirement Age for Inactive
Vested Participants:**

Age 60 (previously, age 65) for Group 1 and 2 members and age 55 for Group 4 members hired prior to April 2, 2012. For members hired April 2, 2012 or later, age 60 for Group 1 members, age 55 for Group 2 members and age 50 for Group 4 members.

Unknown Data for Participants:

Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.

Age of Spouse:

Females 3 years younger than their spouses.

Percent Married:

80%

Net Investment Return:

7.60% (previously, 7.75%)

Interest on Employee Contributions:

3.50%

Administrative Expenses:

\$415,000 for calendar 2014 increasing 4.5% per year (previously, \$370,000 for calendar 2012)

Salary Increases:

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

		2014 and 2015	2016 and later
	Groups 1 and 2	3.50%	4.50%
	Group 4	3.50%	4.75%
	Previously,		
		2012 and 2013	2014 and later
	Groups 1 and 2	3.50%	4.50%
	Group 4	3.50%	4.75%
2013 Salary:	Salary reported in the data for employees hired in 2012 or earlier. Salary estimated from contributions, then annualized, for employees hired in 2013. Salaries were also adjusted to reflect the following:		
	<ul style="list-style-type: none">➤ Payroll was increased by 1.5% as of July 1, 2011 and 2.0% each year as of July 1, 2012 and July 1, 2013 for the Police department to reflect newly settled contracts.➤ Payroll was increased by 2.0% each year as of July 1, 2012 and July 1, 2013 for the Fire department to reflect anticipated negotiated increases.		
Total Service:	Total creditable service reported in the data.		
Net 3(8)(c) Liability	No liability is valued for benefits paid to or received from other municipal systems.		
Actuarial Value of Assets:	Market value of assets less unrecognized return in each of the last five years. Unrecognized return is equal to the difference between the actual market value return and the expected market value return and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.		
	Market value of assets as reported in the Annual Statement.		
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method. Entry Age is the age of the participant less total creditable service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. Normal Cost is determined by using the plan of benefits applicable to each participant. (Previously, Normal Cost determined as if the current plan of benefits had always been in effect.)		

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

Changes in Assumptions:

Based on past experience and future expectations, the following actuarial assumptions were changed:

- The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.
- The investment return assumption was lowered from 7.75% to 7.60%.
- The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally using Scale AA from 2010.
- The mortality assumption for non-disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale AA from 2010.
- The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward two years projected generationally using Scale AA from 2010.
- The assumed retirement age for terminated vested participants was changed from age 65 to age 60 for Group 1 and 2 members hired prior to April 2, 2012.
- The salary increase assumption was reset as follows:

	2014 and 2015	2016 and later
Groups 1 and 2	3.50%	4.50%
Group 4	3.50%	4.75%

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

EXHIBIT VII

Summary of Plan Provisions

This exhibit summarizes the major provisions of Chapter 32 of the Laws of Massachusetts.

Plan Year: January 1 – December 31

Retirement Benefits

Employees covered by the Contributory Retirement Law are classified into one of four groups depending on job classification. Group 1 comprises most positions in state and local government. It is the general category of public employees. Group 4 comprises mainly police and firefighters. Group 2 is for other specified hazardous occupations. (Officers and inspectors of the State Police are classified as Group 3.)

For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following table based on the age of the member at retirement:

Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.5	65 or over	60 or over	55 or over
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	--	49
1.8	58	--	48
1.7	57	--	47
1.6	56	--	46
1.5	55	--	45

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

A member's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement.

For employees hired on April 2, 2012 or later, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following tables based on the age and years of creditable service of the member at retirement:

For members with less than 30 years of creditable service:

Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.50	67 or over	62 or over	57 or over
2.35	66	61	56
2.20	65	60	55
2.05	64	59	54
1.90	63	58	53
1.75	62	57	52
1.60	61	56	51
1.45	60	55	50

For members with 30 years of creditable service or greater:

Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.500	67 or over	62 or over	57 or over
2.375	66	61	56
2.250	65	60	55
2.125	64	59	54
2.000	63	58	53
1.875	62	57	52
1.750	61	56	51
1.625	60	55	50

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

A member's final five-year average salary is defined as the greater of the highest consecutive five-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last five years of creditable service prior to retirement.

For employees who became members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.

For all employees, the maximum annual amount of the retirement allowance is 80 percent of the member's final average salary. Any member who is a veteran also receives an additional yearly retirement allowance of \$15 per year of creditable service, not exceeding \$300. The veteran allowance is paid in addition to the 80 percent maximum.

Employee Contributions

Date of Hire	Contribution Rate
Prior to January 1, 1975	5%
January 1, 1975 – December 31, 1983	7%
January 1, 1984 – June 30, 1996	8%
July 1, 1996 onward	9%

In addition, employees hired after December 31, 1978 contribute an additional 2 percent of salary in excess of \$30,000.

Employees hired after 1983 who voluntarily withdraw their contributions with less than 10 ten years of credited service receive 3% interest on their contributions.

Employees in Group 1 hired on or after April 2, 2012 with 30 years of creditable service or greater will pay a base contribution rate of 6%.

Retirement Benefits (Superannuation)

Members of Group 1, 2 or 4 hired prior to April 2, 2012 may retire upon the attainment of age 55. For retirement at ages below 55, twenty years of creditable service is required.

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

Members hired prior to April 2, 2012 who terminate before age 55 with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System).

Members of Group 1 hired April 2, 2012 or later may retire upon the attainment of age 60. Members of Group 2 or 4 hired April 2, 2012 or later may retire upon the attainment of age 55. Members of Group 4 may retire upon attainment of age 50 with ten years of creditable service.

Members hired April 2, 2012 or later who terminate before age 55 (60 for members of Group 1) with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (60 for members of Group 1) provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System.

Ordinary Disability Benefits

A member who is unable to perform his or her job due to a non-occupational disability will receive a retirement allowance if he or she has ten or more years of creditable service and has not reached age 55. The annual amount of such allowance shall be determined as if the member retired for superannuation at age 55 (age 60 for Group 1 members hired on or after April 2, 2012), based on the amount of creditable service at the date of disability. For veterans, there is a minimum benefit of 50 percent of the member's most recent year's pay plus an annuity based on his or her own contributions.

Accidental Disability Benefit

For a job-connected disability, the benefit is 72 percent of the member's most recent annual pay plus an annuity based on his or her own contributions, plus additional amounts for surviving children. Benefits are capped at 75 percent of annual rate of regular compensation for employees who become members after January 1, 1988.

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

Death Benefits

In general, the beneficiary of an employee who dies in active service will receive a refund of the employee's own contributions. Alternatively, if the employee were eligible to retire on the date of death, a spouse's benefit will be paid equal to the amount the employee would have received under Option C. The surviving spouse of a member who dies with two or more years of credited service has the option of a refund of the employee's contributions or a monthly benefit regardless of eligibility to retire, if they were married for at least one year. There is also a minimum widow's pension of \$500 per month, and there are additional amounts for surviving children.

If an employee's death is job-connected, the spouse will receive 72 percent of the member's most recent annual pay, in addition to a refund of the member's accumulated deductions, plus additional amounts for surviving children. However, in accordance with Section 100 of Chapter 32, the surviving spouse of a police officer, firefighter or corrections officer is killed in the line of duty will be eligible to receive an annual benefit equal to the maximum salary held by the member at the time of death.

Upon the death of a job-connected disability retiree who retired prior to November 7, 1996 and could not elect an Option C benefit, a surviving spouse will receive an allowance of \$6,000 per year if the member dies for a reason unrelated to cause of disability.

"Heart And Lung Law" And Cancer Presumption

Any case of hypertension or heart disease resulting in total or partial disability or death to a uniformed fireman, permanent member of a police department, or certain employees of a county correctional facility is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. Any case of disease of the lungs or respiratory tract resulting in total disability or death to a uniformed fireman is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. There is an additional presumption for uniformed firemen that certain types of cancer are job-related if onset occurs while actively employed or within five years of retirement.

SECTION 4: Reporting Information for the Town of Brookline Contributory Retirement System

Options

Members may elect to receive a full retirement allowance payable for life under Option A. Under Option B a member may elect to receive a lower monthly allowance in exchange for a guarantee that at the time of death any contributions not expended for annuity payments will be refunded to the beneficiary. Option C allows the member to take a lesser retirement allowance in exchange for providing a survivor with two-thirds of the lesser amount. Option C pensioners will have benefits converted from a reduced to a full retirement if the beneficiary predeceases the retiree.

Post-Retirement Benefits

The Board has adopted the provisions of Section 51 of Chapter 127 of the Acts of 1999, which provide that the Retirement Board may approve an annual COLA in excess of the Consumer Price Index but not to exceed a 3% COLA on the first \$13,000 of a retirement allowance. Cost-of-living increases granted prior to July 1, 1998 are reimbursed by the Commonwealth and not reflected in this report.

Changes in Plan Provisions

Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.

SECTION 5: GASB 67/68 Information for the Town of Brookline Contributory Retirement System

EXHIBIT 1

Net Pension Liability

The components of the net pension liability of the Town of Brookline Contributory Retirement System at December 31, 2013 were as follows:

Total pension liability	\$434,346,018
Plan fiduciary net position	245,478,646
System's net pension liability	188,867,372
Plan fiduciary net position as a percentage of the total pension liability	56.52%

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of December 31, 2013, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	4.50%
Salary increases	

		<u>2014 and 2015</u>	<u>2016 and later</u>
	Group 1 and Group 2	3.50%	4.50%
	Group 4	3.50%	4.75%
Investment rate of return	7.60%, net of pension plan investment expense, including inflation		
Cost of Living Adjustments	3% of first \$13,000		
Healthy:			
Pre-Retirement	RP-2000 Employee Mortality Table projected generationally with Scale AA from 2010		
Post-Retirement	RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale AA from 2010		
Disabled:	RP-2000 Employee Mortality Table set forward two years projected generationally with Scale AA from 2010		

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding

SECTION 5: GASB 67/68 Information for the Town of Brookline Contributory Retirement System

expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2013 are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return
Domestic equity	6.60%
International developed markets equity	7.10%
International emerging markets equity	9.40%
Core fixed income	2.20%
Real estate	4.40%
Commodities	4.40%
Hedge fund, GTAA, Risk parity	3.90%
Private equity	11.70%

Discount rate: The discount rate used to measure the total pension liability was 7.60%. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that the Town of Brookline Contributory Retirement System contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the Town of Brookline Contributory Retirement System, calculated using the discount rate of 7.60%, as well as what the Town of Brookline Contributory Retirement System's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.60%) or 1-percentage-point higher (8.60%) than the current rate:

	1% Decrease (6.60%)	Current Discount (7.60%)	1% Increase (8.60%)
Town of Brookline Contributory Retirement System's net pension liability as of December 31, 2013	\$235,523,074	\$188,867,372	\$149,275,792

SECTION 5: GASB 67/68 Information for the Town of Brookline Contributory Retirement System

EXHIBIT 2

Pension Expense and Deferred Outflows/Inflows of Resources Related to Pensions

A. Pension expense for the year ended June 30, 2015

Service cost	\$9,255,302
Interest	--
Recognized portion of current-period difference between expected and actual experience	--
Contributions – employee	--
Projected earnings on pension plan investments	--
Recognized portion of current-period difference between projected and actual earnings on pension plan investments	--
Recognition of deferred outflows of resources	--
Recognition of deferred inflows of resources	--
Pension expense for fiscal year ended June 30, 2015	To be determined

B. Deferred outflows/inflows of resources related to pensions

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	--	--
Changes of assumptions	--	--
Changes of benefit terms	--	--
Net difference between projected and actual earnings on pension plan investments	--	--
Total	To be determined	To be determined

C. Projected recognition of deferred outflows/(inflows)

	Year Ended June 30,	Recognition
	2016	--
	2017	--
	2018	--
	2019	--
	2020	--
	Thereafter	--

Note: Entry Age Normal liabilities calculated using ages and service amounts as of January 1, 2014 are used to measure the pension expense for fiscal year ended June 30, 2015.

SECTION 5: GASB 67/68 Information for the Town of Brookline Contributory Retirement System

EXHIBIT 3

Schedule of Changes in the Net Pension Liability – Last Ten Years

	Year End December 31,									
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Total pension liability										
Service cost	\$9,255,302									
Interest	--									
Differences between expected and actual experience	--									
Changes of assumptions	--									
Changes of benefit terms	--									
Benefit payments, including refunds of employee contributions	--									
Net change in total pension liability	TBD									
Total pension liability - beginning	434,346,018									
Total pension liability - ending (a)	TBD									
Plan fiduciary net position										
Contributions - employer	--									
Contributions - employee	--									
Net investment income	--									
Benefit payments, including refunds of employee contributions	--									
Other	--									
Net change in fiduciary net position	TBD									
Plan fiduciary net position - beginning	245,478,646									
Plan fiduciary net position - ending (b)	TBD									
Net pension liability – ending: (a)-(b)	TBD									
Plan's fiduciary net position as a percentage of the total pension liability	TBD									
Covered-employee payroll	\$64,829,168									
Net pension liability as a percentage of covered-employee payroll	TBD									

*Covered-employee payroll as reported in the January 1, 2014 funding valuation report

SECTION 5: GASB 67/68 Information for the Town of Brookline Contributory Retirement System

EXHIBIT 4

Schedule of Contributions – Last Ten Years

	Year End December 31,									
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Actuarially determined contribution*	\$18,204,932									
Contributions in relation to the actuarially determined contribution	TBD									
Contribution deficiency (excess)	TBD									
Covered-employee payroll	\$64,829,168									
Contributions as a percentage of covered-employee payroll	28.08%									

* Based on the results of the January 1, 2012 actuarial valuation (including assumptions and methods) which determined budgeted appropriation for fiscal 2015.

SECTION 5: GASB Information for Town of Brookline Contributory Retirement System

EXHIBIT 5

Notes to Required Supplementary Information

Valuation date	Actuarial determined contribution rates are calculated as of January 1 two years prior to the end of the employer's fiscal year in which contributions are reported.		
Actuarial cost method	Entry Age Normal Cost Method		
Amortization method	Appropriation increasing 5.50% per year		
Remaining amortization period	As of July 1, 2014, 16 years		
Asset valuation method	The difference between the expected return and the actual investment return on a market value basis is recognized over a five-year period. Asset value is adjusted, if necessary to be within 20% of the market value.		
<hr/>			
Actuarial assumptions:			
Investment rate of return	7.60% (previously, 7.75%)		
Discount rate	7.60% (previously, 7.75%)		
Inflation rate	4.50%		
Projected salary increases		2014 and 2015	2016 and later
	Group 1	3.50%	4.50%
	Group 4	3.50%	4.75%
Cost of living adjustments	3.00% of first \$13,000 of retirement income		
<hr/>			
Plan membership:			
Retired participants and beneficiaries receiving benefits	877		
Inactive participants entitled to a return of their employee contributions	1,394		
Inactive participants with a vested right to a deferred or immediate benefit	43		
Active participants	<u>1,259</u>		
Total	3,573		

SECTION 5: GASB Information for Town of Brookline Contributory Retirement System

Changes in Assumptions:

The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.

The investment return assumption was lowered from 7.75% to 7.60%.

The mortality assumption for non-disabled retirees was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally from 2010 using Scale AA.

The mortality assumption for employees was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally from 2010 using Scale AA.

The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward two years projected generationally from 2010 using Scale AA.

The salary increase assumption was reset to the following:

	2014 and 2015	2016 and later
Groups 1 and 2	3.50%	4.50%
Group 4	3.50%	4.75%

The assumed retirement age for terminated vested participants was changed from age 65 to age 60 for Group 1 and 2 members and remained the same at age 55 for Group 4 members hired prior to April 2, 2012. For participants hired April 2, 2012 or later, the assumption is age 60 for Group 1 members, age 55 for Group 2 members, and age 50 for Group 4 members.

The administrative expense assumption was increased from \$370,000 for calendar 2012 to \$415,000 for calendar 2014.

Changes in Plan Provisions:

Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.
